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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.		
09/780,184	02/09/2001	Craig S. Gittleman	8540G-000038 (GP-300032)	3194		
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•	DICKEY & PIERCE,	EXAMINER				
	P.O. BOX 828 BLOOMFIELD HILLS, MI 48303			RIDLEY, BASIA ANNA		
			ART UNIT	PAPER NUMBER		
		1764				

DATE MAILED: 08/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

	·			V			
		Applicati n N .	Applicant(s)	•			
Office A. C		09/780,184	GITTLEMAN ET AL.				
	Office Action Summary	Examin r	Art Unit				
		Basia Ridley	1764				
The MAILING DATE of this communication appears on the cover sheet with the correspondence address Period for Reply							
THE - Exte after - If the - If NC - Failu - Any earns	ORTENED STATUTORY PERIOD FOR REPLY MAILING DATE OF THIS COMMUNICATION. nsions of time may be available under the provisions of 37 CFR 1.13 SIX (6) MONTHS from the mailing date of this communication. e period for reply specified above is less than thirty (30) days, a reply period for reply is specified above, the maximum statutory period were to reply within the set or extended period for reply will, by statute, reply received by the Office later than three months after the mailing and patent term adjustment. See 37 CFR 1.704(b).	36(a). In no event, however, may a reply be time within the statutory minimum of thirty (30) days will apply and will expire SIX (6) MONTHS from cause the application to become ABANDONE	nely filed s will be considered timely. the mailing date of this com D (35 U.S.C. § 133).	nmunication.			
Status	Decrees to the communication (a) filed on 40.1						
1)⊠	Responsive to communication(s) filed on 10 J						
2a)☐	,—	is action is non-final.					
3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under <i>Ex parte Quayle</i> , 1935 C.D. 11, 453 O.G. 213. Disposition of Claims							
· · _	Claim(s) <u>1-45</u> is/are pending in the application	_					
•	4a) Of the above claim(s) <u>19 and 31-45</u> is/are withdrawn from consideration.						
	Claim(s) <u>20-28 and 30</u> is/are allowed.						
,	 ☐ Claim(s) 1-12,14,16-18 and 29 is/are rejected. 						
·	Claim(s) 13 and 15 is/are objected to.						
·	Claim(s) are subject to restriction and/or	election requirement.					
Applicati	on Papers						
9)⊠	The specification is objected to by the Examiner	·.					
10)⊠ The drawing(s) filed on <u>09 February 2001</u> is/are: a)□ accepted or b)⊠ objected to by the Examiner.							
	Applicant may not request that any objection to the	e drawing(s) be held in abeyance. Se	ee 37 CFR 1.85(a).				
11)	The proposed drawing correction filed on	is: a)☐ approved b)☐ disappro	ved by the Examiner	•			
If approved, corrected drawings are required in reply to this Office action.							
12)[The oath or declaration is objected to by the Exa	aminer.					
Priority ι	ınder 35 U.S.C. §§ 119 and 120						
13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).							
a) All b) Some * c) None of:							
	1. Certified copies of the priority documents have been received.						
	2. Certified copies of the priority documents have been received in Application No						
* 5	3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)). * See the attached detailed Office action for a list of the certified copies not received.						
	14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).						
a) The translation of the foreign language provisional application has been received.							
15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121. Attachment(s)							
	e of References Cited (PTO-892)	4) Interview Summary	(PTO-413) Paper No(s))			
2) 🔲 Notic	e of Draftsperson's Patent Drawing Review (PTO-948) mation Disclosure Statement(s) (PTO-1449) Paper No(s) 2	5) Notice of Informal F	Patent Application (PTO-				

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DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Species A in Paper No. 7 is acknowledged. The traversal is on the ground(s) that the examiner has not established that a serious burden exists if restriction is not required. This is not found persuasive because there is no requirement for the examiner to establish that a serious burden exists if restriction between patentably distinct species is not required. See MPEP 808.01(a).

The requirement is still deemed proper and is therefore made FINAL.

- Claim(s) 19 and 24 are withdrawn from further consideration pursuant to 37 CFR
 1.142(b) as being drawn to a nonelected Species, there being no allowable generic or linking claim.
- 3. Claim 20 is generic and allowable. Accordingly, the restriction requirement as to the encompassed species is hereby withdrawn and claim 24, directed to the species of B is no longer withdrawn from consideration since all of the claims to this species depend from or otherwise include each of the limitations of an allowed generic claim 20. However, claim 19, directed to the species B remain withdrawn from consideration since claim 19 does not depend upon or otherwise include all the limitations of an allowed generic claim 20 as required by 37 CFR 1.141.

In view of the above noted withdrawal of the restriction requirement as to the linked species, applicant(s) are advised that if any claim(s) depending from or including all the limitations of the allowable generic linking claim(s) be presented in a continuation or divisional application, such claims may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Once a restriction requirement is

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withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 44 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

Information Disclosure Statement

4. The information disclosure statement filed as Paper 3 on 15 October 2002 fails to comply with 37 CFR 1.98(a)(1), which requires a list of all patents, publications, or other information submitted for consideration by the Office. It has been placed in the application file, but, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Specification

- 5. The disclosure is objected to because of the following informalities:
- two patents cited on page 12, lines 11-18 do not appear to be relevant to the disclosed invention, specifically USP 3,453,418 titled "Electronic Billing Circuit" and USP 3,846,849 titled "Two-Piece Bedpan".

Appropriate correction is required. The applicant is reminded that no new matter shall be added.

Drawings

6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: "30" in Fig. 1. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

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7. The drawing(s) is/are objected to as failing to comply with 37 CFR 1.84(q) because reference character(s) 1 - 10 in Fig. 1 and reference character(s) 1 - 10 in Fig. is/are lacking lead line(s) between itself/themselves and the detail(s) to which it/they refers(s). Applicant is reminded that reference characters which do not need lead lines because they indicate surface or cross-section on which they are placed must be underlined to make it clear that a lead line has not been left out by mistake. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

- 8. Claim(s) 12-15 is/are objected to because of the following informalities:
- in claim 12, the recitation "the first reaction" should be replaced with --the first reactor--.

Appropriate correction is required. The applicant is reminded that no new matter shall be added.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
- (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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10. Claim(s) 1-3, 12 and 14 is/are rejected under 35 U.S.C. 102(b) as being anticipated by Hufton et al. ("Sorption Enhanced Reaction Process for Hydrogen Production", <u>AIChE</u>).

Regarding claim(s) 1-3, 12 and 14, Hufton et al. disclose(s) system comprising:

- a first reactor which produces a hydrogen-rich gas stream comprising CO (Fig. 1); and
- an apparatus for removing the CO from the hydrogen-rich gas stream (Fig. 1);
- wherein the apparatus comprises a vessel housing an adsorbent adapted to adsorb the CO (Fig. 1);
- wherein the vessel is a pressure swing adsorber (Fig. 1);
- wherein the pressure swing adsorber comprises multiple staged fixed beds (page 248, column 2, lines 19-20);
- wherein the adsorbent is a first adsorbent and wherein the apparatus further comprises a second reactor which is a water gas shift reactor disposed between the first reactor and the vessel (Fig. 1);
- wherein the water gas shift reactor is a high temperature water gas shift reactor (page 248, column 2, lines 1-2).
- 11. Claim(s) 1-7, 12, 14, 16-17 and 29 is/are rejected under 35 U.S.C. 102(e) as being anticipated by Keefer et al. (WO 00/16425).

Regarding claim(s) 1-7, 12, 14, 16-17 and 29 Keefer et al., in Fig. 12 and 13, disclose(s) system comprising:

- a first reactor (445 and 544) which produces a hydrogen-rich gas stream comprising CO; and
- an apparatus (432 and 532) for removing the CO from the hydrogen-rich gas stream;
- wherein the apparatus comprises a vessel housing an adsorbent adapted to adsorb the CO

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(P25/L10-20 and P27/L31-P28/L8);

- wherein the vessel is a pressure swing adsorber (P25/L10-20 and P27/L31-P28/L8);

- wherein the pressure swing adsorber comprises multiple, staged fixed beds (Fig. 1-6);

- wherein the pressure swing adsorber is a rotating vessel (P25/L10-20 and P27/L31-P28/L8);

- wherein the rotating vessel comprises an adsorption region, a depressurization region, a

purge region and a pressurization region (Fig. 1-6 and P7/L20-P15/L4);

- wherein the rotating vessel comprises two fixed valve faces (P9/L2-9);

- wherein the system is a fuel cell system (abstract);

- wherein the adsorbent is a first adsorbent and wherein the apparatus further comprises a

second reactor (448 and 548) which is a water gas shift reactor disposed between the first reactor

(445 and 544) and the vessel (432 and 532);

- wherein the water gas shift reactor is a high temperature water gas shift reactor (P25/L28-

P26/L31);

- the system further comprising an expander downstream of the vessel, wherein the expander

provides a purge gas to be fed back into the vessel (Fig. 1-4); and

- a fuel cell stack having an anode exhaust, the fuel cell stack disposed between the vessel and

the expander, and wherein the expander expands the anode exhaust, the expanded anode exhaust

providing the purge gas to be fed back into the vessel (P25/L10-27 and P27/L21-P28/L8);

- wherein the preferential oxidizer is eliminated from the system (Fig. 12-13).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claim(s) 4-7, 16-18 and 29 rejected under 35 U.S.C. 103(a) as being unpatentable over Hufton et al. ("Sorption Enhanced Reaction Process for Hydrogen Production", <u>AIChE</u>), as applied to claim 1 above, in view of Keefer et al. (WO 00/16425).

Regarding claim(s) 4, Hufton et al. disclose(s) all of the claim limitations as set forth above, but it does not explicitly disclose said pressure swing adsorber comprising a rotating vessel, nor does the reference discloses the specifics of said vessel.

Keefer et al. teaches a pressure swing adsorption system for hydrogen purification comprising rotating vessel (P25/L10-20 and P27/L31-P28/L8). The rotating pressure swing adsorption system is more efficient than conventional systems (P3/L1-26). Additionally said rotating pressure swing adsorption system is less complicated and less expensive to install and it requires less inventory of adsorbent (P3/L1-26).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the rotating PSA vessel of Keefer et al. in the system of Hufton et al., for the purpose of increasing system efficiency and lowering capital and operation costs.

Regarding claim(s) 5-6 and 16-17 Hufton et al. in view of Keefer et al. disclose(s) all of the claim limitations as set forth above. Additionally, Keefer et al. discloses the system:

- wherein the rotating vessel comprises an adsorption region, a depressurization region, a purge region and a pressurization region (Fig. 1-6 and P7/L20-P15/L4);
- wherein the rotating vessel comprises two fixed valve faces (P9/L2-9);
- the system further comprising an expander downstream of the vessel, wherein the expander

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provides a purge gas to be fed back into the vessel (Fig. 1-4); and

- a fuel cell stack having an anode exhaust, the fuel cell stack disposed between the vessel and the expander, and wherein the expander expands the anode exhaust, the expanded anode exhaust providing the purge gas to be fed back into the vessel (P25/L10-27 and P27/L21-P28/L8).

Regarding claim(s) 7 Hufton et al. disclose(s) all of the claim limitations as set forth above, but the reference does not disclose any specific use for produced hydrogen gas. Since it was well known in the art at the time of the invention that fuel-cells need hydrogen for production of electricity, as evidenced by Keefer et al. (P1/L4-P2/L32), it would have been obvious to one having ordinary skill in the art at the time the invention was made to use hydrogen produced in the system of Hufton et al. in a fuel cell system, as doing so would amount to nothing more than use of a known material for its intended use in a known environment to accomplish entirely expected result.

Regarding claim 18, Hufton et al. in view of Keefer et al. disclose all of the claim limitations as set froth above. Additionally, Keefer et al. discloses the system wherein the expander is adapted to provide electrical power for driving the rotating vessel (P11/L6-19, P13/L5-7, P16/L30-P17/L12, P22/L31-P23-9, P25/L10-27 and P27/L21-P28/L8). While the references do not disclose said expander being an isothermal expander, as isothermal expanders are conventional, using an isothermal expander in the system of Hufton et al. in view of Keefer et al. would amount to nothing more than a use of a known apparatus for its intended use in a known environment to accomplish entirely expected result.

Regarding claim(s) 29 Hufton et al. in view of Keefer et al. disclose(s) all of the claim limitations as set forth above. Additionally, both references disclose discloses the system

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wherein the preferential oxidizer is eliminated from the system (Fig. 1 of Hufton et al. and Fig. 12-13 of Keefer et al.).

14. Claim(s) 8-11 rejected under 35 U.S.C. 103(a) as being unpatentable over Hufton et al. ("Sorption Enhanced Reaction Process for Hydrogen Production", <u>AIChE</u>), as applied to claim 1 above, in view of Kirshnamurthy (USP 5,096,470).

Regarding claim(s) 8-9, Hufton et al. disclose(s) all of the claim limitations as set forth above. Additionally the reference is not limited to any specific adsorbents which can be used in the vessel. As adsorbents selected from the group consisting of 5A zeolite, 13X zeolite, and mixtures thereof and adsorbents selected from the group consisting of oxides or salts of copper impregnated or exchanged on activated carbon, alumina and zeolites, oxides or salts of silver impregnated or exchanged on activated carbon, alumina and zeolites, oxides or salts of tin impregnated or exchanged on activated carbon, alumina and zeolites, and mixtures thereof, were known to be useful in the PSA systems for separation of hydrogen from gas streams containing hydrogen and CO, as evidenced by Kirshnamurthy (C7/L14-C8/L2), and further, as the instant specification is silent to unexpected results, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use any adsorbent disclosed by Kirshnamurthy in the PSA system of Hufton et al., as doing so would amount to nothing more than to use of a known material for its intended use in a known environment to accomplish entirely expected result.

Regarding claim(s) 10-11, Hufton et al. disclose(s) all of the claim limitations as set forth above, but it does not explicitly disclose a desiccant material selected from the group consisting

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of zeolite molecular sieves, activated alumina, silica gels, and mixtures thereof disposed upstream of the CO adsorbent.

Kirshnamurthy teaches that is known in the art to pass the feed to the PSA adsorber through a layer of desiccant selected from the group consisting of zeolite molecular sieves, activated alumina, silica gels, and mixtures thereof for the purpose of removing water from said feed..

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use layer of desiccant, as taught by of Kirshnamurthy upstream of the adsorbent of Hufton et al., for the purpose of improving system operation by removing water from feed to said adsorbent.

15. Claim(s) 8-11 rejected under 35 U.S.C. 103(a) as being unpatentable over Keefer et al. (WO 00/16425), as applied to claim 1 above, in view of Kirshnamurthy (USP 5,096,470).

Regarding claim(s) 8-9, Keefer et al. disclose(s) all of the claim limitations as set forth above. Additionally the reference discloses that supported, zeolite type adsorbent can be used in the vessel (P8/L14-29 and P17/L22-33). As adsorbents selected from the group consisting of 5A zeolite, 13X zeolite, and mixtures thereof and adsorbents selected from the group consisting of oxides or salts of copper impregnated or exchanged on activated carbon, alumina and zeolites, oxides or salts of silver impregnated or exchanged on activated carbon, alumina and zeolites, oxides or salts of tin impregnated or exchanged on activated carbon, alumina and zeolites, and mixtures thereof, were known to be useful in the PSA systems for separation of hydrogen from gas streams containing hydrogen and CO, as evidenced by Kirshnamurthy (C7/L14-C8/L2), and further, as the instant specification is silent to unexpected results, it would have been obvious to

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one having ordinary skill in the art at the time the invention was made to use any adsorbent disclosed by Kirshnamurthy in the PSA system of Keefer et al., as doing so would amount to nothing more than to use of a known material for its intended use in a known environment to accomplish entirely expected result.

Regarding claim(s) 10-11, Keefer et al. disclose(s) all of the claim limitations as set forth above and additionally the reference discloses that water vapor can deactivate the adsorbents (P24/L5-14), but it does not explicitly disclose a desiccant material selected from the group consisting of zeolite molecular sieves, activated alumina, silica gels, and mixtures thereof disposed upstream of the CO adsorbent.

Kirshnamurthy teaches that is known in the art to pass the feed to the PSA adsorber through a layer of desiccant selected from the group consisting of zeolite molecular sieves, activated alumina, silica gels, and mixtures thereof for the purpose of removing water from said feed..

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use layer of desiccant, as taught by of Kirshnamurthy upstream of the adsorbent of Keefer et al., for the purpose of improving system operation by removing water from feed to said adsorbent.

16. Claim(s) 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Keefer et al. (WO 00/16425), as applied to claim 1 above.

Regarding claim 18, Keefer et al. disclose all of the claim limitations as set froth above. Additionally, the reference discloses the system wherein the expander is adapted to provide electrical power for driving the rotating vessel (P11/L6-19, P13/L5-7, P16/L30-P17/L12,

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P22/L31-P23-9, P25/L10-27 and P27/L21-P28/L8). While the references do not disclose said expander being an isothermal expander, as isothermal expanders are conventional, using an isothermal expander in the system of Keefer et al. would amount to nothing more than a use of a known apparatus for its intended use in a known environment to accomplish entirely expected result.

17. Claim(s) 1-12, 14, 16-18 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over claim(s) 1-43 of copending Application No. 09/780,079.

Although the conflicting claims are not identical, they are not patentably distinct from each other because said claims 1-12, 14, 16-18 and 29 of the instant application recite only the limitations which are recited in claims 1-43 of Application No. 09/780,079.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP § 2302).

Commonly assigned U.S. Application No. 09/780,079, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee is required under 37 CFR 1.78(c) and 35 U.S.C. 132 to either show that the conflicting inventions were commonly owned at the time the invention in this application was made or to name the prior inventor of the conflicting subject matter. Failure to comply with this requirement will result in a holding of abandonment of the application.

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A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g).

Double Patenting

18. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

19. Claim(s) 1-12, 14, 16-18 and 29 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim(s) 1-43 of copending Application No. 09/780,079. Although the conflicting claims are not identical, they are not patentably distinct from each other because said claims 1-12, 14, 16-18 and 29 of the instant application recite only the limitations which are recited in claims 1-43 of Application No. 09/780,079.

This is a <u>provisional</u> obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Allowable Subject Matter

20. Claim(s) 13 and 15 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

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21. Claim(s) 20-28 and 30 are allowed.

22. The following is a statement of reasons for the indication of allowable subject matter:

The claim combination wherein the system comprises a first reactor which produces a hydrogen-rich gas stream, a vessel housing an adsorbent adapted to adsorb the carbon monoxide and a second reactor, which is a water gas shift reactor, disposed between the first reactor and the vessel, wherein said water gas shift reactor includes a second adsorbent adapted to adsorb carbon monoxide, is allowable over the prior art of record.

Conclusion

23. In view of the foregoing, none of the claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Basia Ridley, whose telephone number is (703) 305-5418. The examiner can normally be reached on Monday through Thursday, from 8:30 AM to 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola, can be reached on (703) 308-6824.

The fax phone number for Group 1700 is (703) 872-9311 (for Official papers after Final), (703) 872-9310 (for other Official papers) and (703) 305-6078 (for Unofficial papers). When filing a fax in Group 1700, please indicate in the Header (upper right) "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communication with the PTO that are not for entry into the file of the application. This will expedite processing of your papers.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Basia Ridley Examiner Art Unit 1764

BR

August 25, 2003